

Please replace the existing paragraph starting on Page 25, Line 8¹ with the following paragraph:

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Pulse sensations can also be output based on interaction between cursor 246 and a window. For example, a pulse can be output when the cursor is moved over a border of a window 250 or 252 to signal the user of the location of the cursor. When the cursor 246 is moved within the window's borders, a texture force sensation can be output. The texture can be a series of bumps that are spatially arranged within the area of the window in a predefined pattern; when the cursor moves over a designated bump area, a pulse sensation is output when the cursor moves over designated pulse points or lines. A pulse can also be output when the cursor is moved over a selectable object, such as a link 262 254 in a displayed web page or an icon 256. A vibration can also be output to signify a graphical object which the cursor is currently positioned over. Furthermore, features of a document displaying in window 250 or 252 can also be associated with force sensations.

Please replace the existing paragraph starting on Page 25, Line 12 with the following paragraph:

In another interaction, when the cursor is moved over an icon 256, folder, hyperlink 262, or other graphical target, a pulse sensation is applied. The sensation associated with some elements can be stronger than others to indicate importance or just to differentiate different elements. For example, icons can be associated with stronger pulses than folders, where the folders can be associated with stronger pulses than tool bar items. Also, the strength of a pulse can be associated with the displayed size of the graphical element, where a large tool bar icon can be associated a stronger pulse than a small tool bar icon. On web pages this is particularly interesting, where small graphical targets can be associated with weaker pulses than large graphical targets. Also, on web pages check boxes and hyperlinks can feel different than buttons or graphical elements based on pulse strength. The magnitude of the pulses can also depend on other characteristics of graphical objects, such as an active window as distinguished from a background window, file folder icons of different priorities designated by the user, icons for

compliance can also be used in the actuator's moving member 148, the link member 150, and the moving element itself, where appropriate.

Please replace the existing paragraph starting on Page 17, Line 15 with the following paragraph:

Of course, both the inertial forces described with reference to Figs. 2 and 3 as well as the contact forces of Fig. 4 can be included in a single embodiment. For example, the link member 150 and moving element (cover portion, button, or other moving member) can be coupled to the moving inertial mass. Such an embodiment advantageously provides inertial forces that can always be felt by the user, regardless of how the housing is contacted, as well as contact forces which can be compelling in particular situations.

Please replace the existing paragraph starting on Page 21, Line ¹³~~21~~ with the following paragraph:

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The actuator described herein has the ability to apply short duration force sensation on the housing of the device (and/or on the user's hand). This short duration force sensation is described herein as a "pulse." Ideally the "pulse" is directed substantially along a Z axis orthogonal to the X-Y plane of the support surface 22. In progressively more advanced embodiments, the magnitude of the "pulse" can be controlled; the sense of the "pulse" can be controlled, either positive or negative biased; a "periodic force sensation" can be applied on the housing, where the periodic sensation can have a magnitude and a frequency, e.g. a sine wave; the periodic sensation can be selectable among a sine wave, square wave, saw-toothed-up wave, saw-toothed-down wave, and triangle wave; an envelope can be applied to the period signal, allowing for variation in magnitude over time; and the resulting force signal can be "impulse wave shaped" as described in U.S. Patent No. 5,959,613. There are two ways the period sensations can be communicated from the host to the device. The wave forms can be "streamed" as described in U.S. Patent 5,959,613 and pending provisional patent application 60/160,401, both incorporated herein by reference. Or the waveforms can be conveyed through high level

EXAMINER'S AMENDMENT

1. An examiner's amendment to the record appears below. Should the changes and/or additions be unacceptable to applicant, an amendment may be filed as provided by 37 CFR 1.312. To ensure consideration of such an amendment, it **MUST** be submitted no later than the payment of the issue fee.

2. Authorization for this examiner's amendment was given in a telephone interview with Hean Koo on December 14, 2009.

The application has been amended as follows:

In reference to claims.

Claim 28, line 12, after "to the sphere", delete "via", add "by vibrating".

Claim 39, line 12, after "to the sphere", delete "via", add "based on the sensor signals by vibrating".

Cancel claim 50.

Claim 51, line ⁸7, after "to the sphere", delete "via", add "based on sensor signals by vibrating".

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Cancel claim 63.

Allowable Subject Matter

3. Claims 28-34, 37-48, 51-56 and 60-61 are allowed.

4. The following is an examiner's statement of reasons for allowance: The present invention relates to a haptic device using in a trackball apparatus by vibrating a roller that configured to output feedback to the sphere of the trackball.